

Construction Waste Management TECHNICAL GUIDE

TG 01524

1. COORDINATION ISSUES:

- 1.1. Include this section in all projects to address construction and demolition waste management requirements: salvaging, recycling, and landfill/incinerator disposal.
- 1.2. At this time, DAGS does not require salvaging and recycling for all projects. Verify the applicability of the requirements of this TG with the DAGS Project Coordinator.

2. DESIGN ISSUES:

- 2.1. This TG is based on the recommendations of a Design Review (dated 12/14/02) of the Final Draft (February 19, 2002) of the DCCM by O'Brien & Company, Inc. for DBEDT and DAGS. It also incorporates clauses from an un-issued TG 01524 v04.08 prepared by Scott Ojiri, DAGS.
- 2.2. Currently, extensive waste management requirements such as salvaging and recycling could result in a net increase in project cost. Give priority to waste management practices which reduce cost, or do not increase costs substantially.
- 2.3. The overall goal is to incorporate no-cost/low-cost strategies to increase construction waste reduction and recycling.
- 2.4. For demolition or major renovation projects, perform a walkthrough of the site with an experienced recycler/demolition or remodel contractor to identify high-potential recyclable materials. These are materials that are generated in a high volume, have market value, and can most easily be source separated. List that material in Performance [Goals][Requirements] paragraphs in Guide Specification. Also list the materials selected in Table 1: Waste Identification of the Waste Management Plan (Appendix A) of the Guide Specification for the Contractor to use.

3. DRAWING NOTES: (Not Used)

4. STANDARD DRAWINGS: (Not Used)

5. SPECIFICATION NOTES: (Not Used)

6. GUIDE SPECIFICATIONS:

- 6.1. Section 01524 Construction Waste Management: Use this Section with all projects

SPECIFIER'S NOTE: Boxed text is used for notes to the specifier and should be completely deleted from the final text. You can hide all Boxed text by modifying the "CMT" Style so that it is "Hidden" text.

Where <**BOLD text angle brackets**> is shown in this specification section, insert wording, numbers, etc. as appropriate and delete brackets.

Where [**BOLD text in square brackets**] is shown, a choice is indicated. Make the appropriate choice and delete the brackets.

Maintain footer notation with the current version used (e.g. TG01524 v06.01). Verify that section titles cross referenced in this Section correspond to this Project's specifications; Section titles may have changed.

SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplemental Conditions. This Section uses the term "Owner." Change this term to the appropriate term as defined in the General and Supplemental Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

PART 1 - GENERAL

1.01 SUMMARY

- A. This section requires implementation of a waste management program for salvaging, recycling, and disposing non-hazardous construction and demolition debris. It is intended to assure that waste material is handled in the proper manner. A secondary purpose is to reduce the amount of waste requiring landfill disposal and to promote more efficient use of construction materials.
- B. This Section includes administrative and procedural requirements for the following:

Adjust list below to suit Project.

- 1. Salvaging nonhazardous [demolition] [and] [construction] waste.
- 2. Recycling nonhazardous [demolition] [and] [construction] waste.
- 3. Disposing of nonhazardous [demolition] [and] [construction] waste.

- C. Related Sections include the following:

List below only procedures that the reader might expect to find in this Section but are specified elsewhere.

- 1. Division 1 Section "Summary of Multiple Contracts" for coordination of responsibilities for waste management.
- 2. Division 1 Section "LEED Requirements" for additional LEED requirements.
- 3. Division 1 Section "Temporary Facilities and Controls" for environmental-protection measures during construction[, and location of waste containers at Project site].
- 4. Division 1 Section "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements[, and for disposition of hazardous waste].
- 5. Division 2 Section "Building Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements[, and for disposition of hazardous waste].
- 6. Division 2 Section "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

7. Division 4 Section "Unit Masonry Assemblies" for disposal requirements for masonry waste.
 8. Division 4 Section "Stone Veneer Assemblies" for disposal requirements for excess stone and stone waste.
- D. DAGS' goal is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that goal, the Contractor shall:
1. Practice efficient waste management when sizing, cutting, and installing products and materials and
 2. Use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.
- 1.02 **MANAGEMENT** - The Contractor shall take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to segregate the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling shall accrue to the Contractor. Firms and facilities used for recycling, reuse, and disposal shall be appropriately permitted for the intended use to the extent required by federal, state, and local regulations.
- 1.03 **DEFINITIONS**
- A. **Construction Waste:** Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
 - B. **Demolition Waste:** Building and site improvement materials resulting from demolition or selective demolition operations.
 - C. **Disposal:** Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
 - D. **Recycle:** Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
 - E. **Salvage:** Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
 - F. **Salvage and Reuse:** Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 REFERENCES –

- A. *A Contractor's Waste Management Guide: Best Management Practices and Tools for Job Site Recycling and Waste Reduction in Hawaii*, 1999. Request a copy from the State of Hawaii, Clean Hawaii Center (808) 587-3802 or download from www.hawaii.gov/dbedt/ert/cwmg/index.html.
- B. *Minimizing Construction & Demolition Waste*. State of Hawaii, Department of Health guidance on construction and demolition (C&D) waste management and listing of permitted C&D waste management facilities. Download from www.state.hi.us/health/eh/shwb/sw.

1.05 PERFORMANCE [GOALS] [REQUIREMENTS]

Retain one of two options in title above to coordinate with selections made in this Article.

First option in paragraph below is requirement for LEED Credit MR 2.1; second option is for Credit MR 2.2.

- A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of [50] [75] <Insert number> percent by weight of total waste generated by the Work.

Retain paragraph above or one of two paragraphs and associated subparagraphs below.

- B. Salvage/Recycle [Goals] [Requirements]: Owner's goal is to salvage and recycle as much nonhazardous [demolition] [and] [construction] waste as possible including the following materials:

Retain paragraph above or below. If retaining below, delete percentages in associated subparagraphs.

- C. Salvage/Recycle [Goals] [Requirements]: Owner's goal is to salvage and recycle as much nonhazardous [demolition] [and] [construction] waste as possible. Owner has established minimum goals for the following materials:

Retain subparagraphs below with either paragraph above. Subparagraphs are examples of the most common demolition and construction waste that can be salvaged or recycled; adjust list or add other types of waste to suit Project; verify capabilities of local recycling facilities. If retaining last paragraph above, insert required percentages of waste to be salvaged or recycled to suit Project.

- 1. Demolition Waste:
 - a. Green waste.
 - b. Asphaltic concrete paving
 - c. Concrete.
 - d. Concrete reinforcing steel.
 - e. Brick.
 - f. Concrete masonry units.
 - g. Wood studs.

- h. Wood joists.
- i. Plywood and oriented strand board.
- j. Wood paneling.
- k. Wood trim.
- l. Structural and miscellaneous steel.
- m. Rough hardware.
- n. Roofing.
- o. Insulation.
- p. Doors and frames.
- q. Door hardware.
- r. Windows.
- s. Glazing.
- t. Metal studs.
- u. Gypsum board.
- v. Acoustical tile and panels.
- w. Carpet.
- x. Carpet pad.
- y. Demountable partitions.
- z. Equipment.
- aa. Cabinets.
- bb. Plumbing fixtures.
- cc. Piping.
- dd. Supports and hangers.
- ee. Valves.
- ff. Sprinklers.
- gg. Mechanical equipment.
- hh. Refrigerants.
- ii. Electrical conduit.
- jj. Copper wiring.
- kk. Lighting fixtures.
- ll. Lamps.
- mm. Ballasts.
- nn. Electrical devices.
- oo. Switchgear and panelboards.
- pp. Transformers.
- qq. **<Insert other materials required.>**

2. Construction Waste:

- a. Site-clearing waste (including Green Waste, Soil, Rock).
- b. Masonry and CMU.
- c. Lumber.
- d. Wood sheet materials.
- e. Wood trim.
- f. Metals.
- g. Roofing.
- h. Insulation.
- i. Carpet and pad.
- j. Gypsum board.
- k. Piping.
- l. Electrical conduit.

- m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
- 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.
- n. **<Insert other materials required.>**

1.06 SUBMITTALS

- A. Waste Management Plan: Submit [3] **<Insert number>** copies of plan within [7] [30] **<Insert number>** days of date established for [commencement of the Work] [the Notice to Proceed] [the Notice of Award].

See Evaluations for example of Progress Reports in paragraph below.

Delete entire paragraph "Waste Reduction Progress Reports" below unless directed to leave it by Project Coordinator.

- B. Waste Reduction Progress Reports: Concurrent with each **Payment Application**, submit [three] **<Insert number>** copies of report. [Include separate reports for demolition and construction waste.] Failure to submit this report may render the **Payment Application incomplete and delay payment**. Include the following information (the Progress Reports may be submitted in a form similar to Table 2 of Appendix A):
1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in **tons (tonnes)**.
 4. Quantity of waste salvaged, both estimated and actual in **tons (tonnes)**.
 5. Quantity of waste recycled, both estimated and actual in **tons (tonnes)**.
 6. Total quantity of waste recovered (salvaged plus recycled) in **tons (tonnes)**.
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
 8. **Records (Donations, Sales, Recycling/Processing, Landfill/Incinerator) as described in the following paragraph)**
- C. Before request for Substantial Completion, submit:

Submittals in first four paragraphs below document compliance with requirements for LEED Credits MR 2.1 and 2.2. Submittals are not required to be submitted to U.S. Green Building Council (USGBC) as part of LEED certification process but will be needed if Architect or Owner signs letter for LEED credits. If Contractor is required to sign letter, requiring these submittals will help ensure that Contractor has adequate records in case USGBC audits documents for Credits MR 2.1 and 2.2.

1. Waste Reduction Calculations: Before request for Substantial Completion, submit [three] **<Insert number>** copies of calculated end-of-Project rates for salvage, recycling,

and disposal as a percentage of total waste generated by the Work. Fill out the actual quantities in Appendix A Table 2 WASTE REDUCTION WORK PLAN. Also include an actual Cost/Revenue analysis to be compared with the projected Cost/Revenue analysis of the Waste Management Plan (See Appendix A Table 3).

2. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
3. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
4. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
5. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

Retain paragraph below if Contractor rather than Architect or Owner is required to sign letter for LEED credits.

- D. LEED Submittal: LEED letter template for Credit MR 2.1[**and 2.2**], signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

Coordinate first paragraph below with qualification requirements retained in "Quality Assurance" Article.

- E. Qualification Data: For [**Waste Management Coordinator**] [**and**] [**refrigerant recovery technician**].
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.07 QUALITY ASSURANCE

LEED accreditation in first paragraph below is relatively new and availability of personnel with this accreditation may be limited, especially among contractors' personnel.

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

In paragraph below, identify specific participants not mentioned in Division 1.

- D. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

Delete subparagraphs below if not required. If retaining, insert additional requirements to suit Project.

1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each subcontractor.

1.08 WASTE MANAGEMENT PLAN

The requirements for the Contractor's waste management plan must be coordinated with the waste management plan for the site. Revise this paragraph as necessary to meet the site's requirements.

Retain option in first paragraph below if Project requires selective demolition or building demolition.

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Use the plan included in Appendix A of this section and fill out the appropriate items. [Include separate sections in plan for demolition and construction waste.] Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Management Coordinator: Indicate name of individual(s) to be responsible for implementing, monitoring, and reporting status of waste management plan.
- C. Waste Identification: Fill out Table 1 of Appendix A. Indicate anticipated types and quantities of [demolition] [site-clearing] [and] [construction] waste generated by the Work. Include estimated quantities and assumptions for estimates.
- D. Waste Reduction Work Plan: Fill out the estimated quantities in Table 2 of Appendix A. The actual quantities will be filled out at the end of the project. List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

If desired, list local charitable organizations such as Habitat for Humanity in first subparagraph below.

3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

See Evaluations for example of cost/revenue analysis in paragraph below.

- E. Cost/Revenue Analysis: Fill out Table 3 of Appendix A. Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings from reusing materials versus purchasing new materials.
 7. Savings in hauling and tipping fees by donating materials.
 8. Savings in hauling and tipping fees that are avoided.
 9. Handling and transportation costs. Include cost of collection containers for each type of waste.
 10. Net additional cost or net savings from waste management plan.

If retaining paragraph below, insert sample forms at end of Section. See Evaluations or use forms required by Owner.

- F. Forms: Prepare waste management plan on forms included in Appendix A.

PART 2 - PRODUCTS

- 2.01 MATERIALS – Recycled-content, salvaged, or otherwise resource-efficient products are specified in appropriate sections.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by the [Architect] [and] [Contracting Officer]. Provide handling, containers, storage, signage, transportation, and other

items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with Division 1 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 1. Distribute waste management plan to everyone concerned within [three] <Insert number> days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
 3. Encourage the practice of efficient waste reduction and waste management when, sizing, cutting, and installing products and materials.
 4. Use meetings, signage, and subcontractor agreements to communicate the goals of the waste reduction plan. Consider incorporating the meetings with the safety meetings.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.
- E. Provide a central cutting area to facilitate re-use of existing cutoffs and to consolidate scrap for recycling.

3.02 SALVAGING DEMOLITION WASTE

- A. First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered.
- B. Salvaged Items for Reuse in the Work:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Items shall meet or exceed specification requirements.
 6. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

- C. Salvaged Items for [**Sale**] [**and**] [**Donation**]: [**Permitted**] [**Not permitted**] on Project site.
- D. Salvaged Items for Owner's Use:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area [**on-site**] [**off-site**] [**designated by Owner**].
 5. Protect items from damage during transport and storage.

Paragraph below is an example of additional requirements that can be added for salvaging materials. Insert other requirements to suit Project.

Leaving door hardware attached to doors can make it easier to reuse in another Project.

- E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- F. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- G. Metals: Separate metals by type.
1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- H. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- I. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- J. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.
- K. Carpet[**and Pad**]: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
1. Store clean, dry carpet[**and pad**] in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather. Properly dispose of liquids.
- M. Plumbing Fixtures: Separate by type and size.
- N. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

- O. Lighting Fixtures: Separate lamps by type and protect from breakage.
- P. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- Q. Conduit: Reduce conduit to straight lengths and store by type and size.

3.03 RECYCLING [DEMOLITION] [AND] [CONSTRUCTION] WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.

Paragraph and subparagraph below may be helpful for bidders with little or no previous experience with recycling. List of recycling and processing facilities is available from telephone directories and many local and state authorities.

Refer to "Minimizing Construction & Demolition Waste (May 2004)" for C&D Waste Management Facilities in Hawaii. Also, contact the State of Hawaii, Solid Waste Section (808) 586-4226 for more information on permitted recycling, processing and disposal facilities.

- B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:

1. <Insert names and telephone numbers of local recycling receivers and processors of recyclable materials permitted by the State Department of Health (DOH).>

Allowing Contractor to accrue some portion of the recycling incentives in paragraph below could result in better recovery rates than if Owner accrues all of the incentives.

- C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall [accrue to Owner] [accrue to Contractor] [be shared equally by Owner and Contractor].
- D. Hazardous Materials:
 1. Materials separated for recycling must be clean: materials must not contain contaminants such as lead-based paint, asbestos, PCB's, or Freon.
 2. Manage hazardous waste materials separately from recyclable materials.

Procedures in paragraph and subparagraphs below describe the "source separated" method for handling recyclable waste. If space at Project site is limited, consider revising below to allow the "co-mingled" method, which takes less space because it permits all recyclable waste to be placed in a single container that is separated later at the recycling facility.

- E. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

- a. Make sure bins are in convenient locations as close as possible to where material is being generated.
 - b. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.04 RECYCLING DEMOLITION WASTE

Paragraphs and subparagraphs in this Article are examples only; retain or add other specific disposal, cleanup, or removal requirements to suit Project or recycling facilities.

- A. Asphaltic Concrete Paving: Grind asphalt to maximum [1-1/2-inch (38-mm)] [4-inch (100-mm)] size.

Delete subparagraph below if recycled asphaltic concrete paving is not permitted in the Work. If permitted in the Work, add requirement to allow its use in Division 2 Section "Earthwork."

1. Crush asphaltic concrete paving and screen to comply with requirements in Division 2 Section "Earthwork" for use as base course.

Retain paragraph above or first paragraph below; above can be used for general fill.

- B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- C. Clean Concrete: Remove reinforcement, other metals, and other contaminants from concrete and sort with other metals.

Option for larger size in subparagraph below can be used for general fill or riprap; option for smaller size can be used as satisfactory soil for fill or subbase.

1. Pulverize concrete to maximum [1-1/2-inch (38-mm)] [4-inch (100-mm)] size.

Retain subparagraph below if recycled concrete is permitted in the Work, if smaller size is retained in subparagraph above, and if crushed concrete is acceptable for fill or base material for roads. If permitted in the Work, add requirement to allow its use in Division 2 Section "Earthwork."

2. Crush concrete and screen to comply with requirements in Division 2 Section "Earthwork" for use as satisfactory soil for fill or subbase.
- D. Clean Masonry: Remove metal reinforcement, anchors, ties, and other contaminants from masonry and sort with other metals.

Retain one of two subparagraphs and associated subparagraphs below. Option for largest size in first subparagraph can be used for general fill; brick masonry in smaller sizes can be used for landscape mulch; concrete masonry in smaller sizes can be used as satisfactory soil for fill or subbase.

1. Pulverize masonry to maximum [3/4-inch (19-mm)] [1-inch (25-mm)] [1-1/2-inch (38-mm)] [4-inch (100-mm)] size.

Delete first two subparagraphs below if recycled masonry is not permitted in the Work. If permitted in the Work, add requirement to allow its use in appropriate Division 2 Section.

- a. Crush masonry and screen to comply with requirements in Division 2 Section "Earthwork" for use as [general fill] [satisfactory soil for fill or subbase].
 - b. Crush masonry and screen to comply with requirements in Division 2 Section "Exterior Plants" for use as mineral mulch.
2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Clean untreated, unpainted wood: Send to permitted recycling facility.
- F. Green waste: Send to permitted recycling facility.
- G. Clean Metals: Send to permitted recycling facility.

3.05 RECYCLING CONSTRUCTION WASTE

Paragraphs and subparagraphs in this Article are examples of items that are common to normal construction operations; retain or add other specific disposal, cleanup, or removal requirements to suit Project or recycling facilities.

- A. Packaging:
1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Untreated Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Untreated Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees [on-site] [at permitted recycling facility].

Delete subparagraph below if recycled site-clearing waste is not permitted in the Work, which is practical only with first option above. If permitted in the Work, add requirement to allow its use in Division 2 Section "Exterior Plants."

1. Comply with requirements in Division 2 Section "Exterior Plants" for use of chipped organic waste as organic mulch.

C. Wood Materials:

1. **Untreated** Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. **Untreated** Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

Delete subparagraph below if recycled sawdust is not permitted in the Work. If permitted in the Work, add requirement to allow its use in Division 2 Section "Exterior Plants."

- a. Comply with requirements in Division 2 Section "Exterior Plants" for use of clean sawdust as organic mulch.

Grinding must be done on-site. There is currently no DOH permitted facility for recycling gypsum board.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

Delete subparagraph below if recycled gypsum board is not permitted in the Work. If permitted in the Work, add requirement to allow its use in Division 2 Section "Exterior Plants."

- a. Comply with requirements in Division 2 Section "Exterior Plants" for use of clean ground gypsum board as inorganic soil amendment.

3.06 DISPOSAL OF WASTE

Add other specific disposal, cleanup, or removal requirements to suit Project.

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator **currently permitted** to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage.

- B. Burning: Do not burn waste materials.

Retain paragraph above or below; burning is usually not permitted.

- C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

Retain paragraph below if disposal is permitted on Owner's property; revise, if applicable, to indicate limits on type of materials that may be disposed of on-site.

- D. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property. Note: on-site disposal may require solid waste management permit from DOH, Solid Waste Section.

Delete paragraph above and retain paragraph below when disposal off Owner's property is required. Add specific requirements for off-site disposal to suit Project.

- E. Disposal: Transport waste materials off Owner's property and legally dispose of them at a permitted landfill.

END OF SECTION 01524

APPENDIX A

WASTE MANAGEMENT PLAN

Project Title: <**Insert Project Title**>

DAGS Job No.: <**Insert Job Number**>

Waste Management Coordinator: <**Insert Name, Title, and contact information**>

Recycling Goal – To recycle/salvage <**Insert Percentage**> of waste generated on the site.

TABLE 1: WASTE IDENTIFICATION

Material	Est. Qty.	Est. tons *	Point of Generation	Comments/Assumptions

* Avg volume-to-weight conversions are:

Mixed waste 5.7 yds/ton

Wood 6.7 yds/ton

Cardboard 20 yds/ton

Drywall 4 yds/ton

Rubble 1.4 yds/ton

TABLE 2: WASTE REDUCTION WORK PLAN

Material	S/R/D *	Est Qty S/R/D (tons)	Actual Qty S/R/D(tons)	Handling and Transport Procedures	Destination (Name, address, phone) **

*S Salvage/Reuse
R Recycle
D Dispose

** For materials sent for recycling or disposal, send to facilities currently permitted by the DOH, Solid Waste Section (808) 586-4226.
No solid waste management permit required for on-site processing of clean waste concrete, provided the processed product meets the “inert fill material” definition in Chapter 342H, HRS.
Solid Waste Management Permit required if destination site accepts for processing such waste materials (eg. Clean waste concrete) from other sites.

TABLE 3: COST/REVENUE ANALYSIS

Material	Est Cost of Disposal(1)	Est Revenue from Salvage/Recycle(2)	Est Cost of Salvage/Recycle(3)	Est Net Savings/Cost (1)+(2)-(3)